Notice of Intent

Crystal Lake Dam Rehabilitation

August 31, 2016

Prepared for:
City of Haverhill Water Department

Submitted to:
Haverhill Conservation Commission

Weston&Sampson

Five Centennial Drive
Peabody, MA 01960-7985
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planning, permitting, design, construction, operation, maintenance, management, & equipment

Weston&Sampson®

Haverhill – Crystal Lake Dam
WSE Project No. 2160199

September 1, 2016

City of Haverhill Conservation Commission
City Hall Room 300
4 summer Street
Haverhill, MA 01830

Re: New NOI Filing
Crystal Lake Dam Rehabilitation Project

Dear Members of the Commission:

On behalf of the City of Haverhill Water Department, Weston & Sampson Engineers, Inc. is hereby enclosing one copy of the HCC Form 3 – Notice of Intent Local Application Form, one (1) paper copy of the NOI submittal package (original) and ten (10) copies of the plans to fulfill the requirements of the Massachusetts Wetlands Protection Act, M.G.L. Chapter 131, Section 40 submittal requirements and the City of Haverhill's Municipal Ordinance Chapter 253. Additionally, a pdf version of the NOI will be emailed to the conservation commission agent. This submittal is a formal Notice of Intent for the Crystal Lake Dam Rehabilitation project.

As part of the filing, we have attached the following:

Appendix A: Project Description
Appendix B: Alternatives Analysis
Appendix C: Stormwater Report
Appendix D: Project Maps
Appendix E: Contract Specifications
Appendix F: Abutters List / Notice to Abutters
Appendix G: Wetlands Memorandum
Appendix H: Photographs

If you have any questions regarding this submittal, please contact me at (978) 532-1900.

Very truly yours,

WESTON & SAMPSON

Mel Higgins, PWS
Senior Environmental Scientist

City of Haverhill Conservation Commission

HCC Form 3 – Notice of Intent Local Application Form

A. STATUTE APPLICABILITY

This application is being filed with the Commission in accordance with the following (check all that apply):

X Massachusetts Wetlands Protection Act, M.G.L. Chapter 131, Section 40

X Haverhill Municipal Ordinance Chapter 253

B. GENERAL INFORMATION

Applicant _City of Haverhill Water Department_____

Property Owner same

Representative Weston & Sampson Engineers, Inc.

Location (Street Address) off Lake Street

Assessor's Parcel Identification 571-1-17

C. APPLICATION CHECKLIST

The Commission requires the submittal of this original, completed Form; ten (10) paper copies of site plans; and one (1) paper copy of all other materials. Additionally, the Commission requires the submittal of individual PDFs of this Form and all listed application materials. If practical, related items may be combined into a single PDF. PDFs should not mix larger format sheets (e.g. site plans) with smaller sheets (e.g. letters). These submittal requirements also apply to supplemental information provided during the public hearing. The following materials shall be submitted with this form (check all that apply):

X Completed, current WPA Form 3, 3A, or 4 and NOI Wetland Fee Transmittal Form

X Project Narrative with description of resource areas & delineation methodology and demonstration of compliance with pertinent Performance Standards

X Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan

X Site Plans clearly describing the location and nature of the work, including such information as site boundaries, wetlands, topography, existing and proposed conditions, vegetation cover, soils, erosion & sedimentation controls, Title 5 compliance, flood storage calculations…(24" x 36" max. sheet size)

☐ MassDEP Bordering Vegetated Wetland Delineation Field Data Forms, as appropriate

☐ Wetland Resource Area Impact Mitigation Plan prepared in accordance with MA Inland Wetland Replication Guidelines, if applicable

☐ Demonstration of compliance with MA River & Stream Crossing Standards, if applicable (The HCC applies the General Standards to all resource area crossings for wildlife passage.)

☐ Simplified or Detailed Wildlife Habitat Evaluation (Appendix A or B), if applicable (See "MA Wildlife Habitat Protection Guidance for Inland Wetlands")

X Demonstration of compliance with MA Stormwater Management Standards, including but not limited to

- X Stormwater Report with pertinent calculations
- X Checklist for Stormwater Report
- X Long-Term Pollution Prevention Plan
- X Operation and Maintenance Plan
- X Illicit Discharge Compliance Statement

X 8½" x 11" sections of the following maps with project location clearly identified

- X USGS Quadrangle

X MassGIS Orthophoto
X City of Haverhill Parcel ID Map, also identifying properties within 300' of subject property
X NRCS Soils Map and Resource Report
X FEMA Flood Insurance Rate Map, if applicable
X MA NHESP Estimated Habitats of Rare Wildlife and Priority Habitats of Rare Species, if applicable
☐ MassDEP/UMass-Amherst Habitat of Potential Regional or Statewide Importance, if applicable
☐ Proof of NOI filing with the MA Natural Heritage & Endangered Species Program, if applicable
X Appropriate Filing Fees, payable to the City of Haverhill, under the Act and Ordinance

☐ Other: _____

D. LOCAL PERMIT DOCUMENTATION

In accordance with 310 CMR 10.05(4)(e), list all obtainable permits, variances, and approvals required by local ordinance with respect to the proposed activity and status of same: _____

_____

E. APPLICATION CERTIFICATION

I have read the Department of Environmental Protection's "Instructions for Completing Application" and the City's Municipal Ordinance under Chapter 253, with all applicable regulations and policies, for the filing of this application with the Haverhill Conservation Commission and agree to its terms and conditions, as amended. I understand the submitted NOI, its plans, and all its supporting materials are public records and may be uploaded to the City's website for public review. As required by the Commission, the wetland resource area(s) are flagged, the corners of proposed structures are staked, and the centerline of proposed roadway(s) and/or driveway(s) are marked, as appropriate, to facilitate site inspections by Commissioners and Conservation Staff.

Signed: _____ 8/22/16
(APPLICANT) (DATE)

F. SITE ACCESS ACKNOWLEDGEMENT

I hereby grant the Haverhill Conservation Commission and its officials permission to enter upon my property at 174 North Avenue 630 2-1-1A to review the filed Notice of Intent and
(STREET ADDRESS AND ASSESSOR'S PARCEL ID)
future site conditions for compliance with the issued Order of Conditions. The sole purpose of this acknowledgement is to allow the Commission and its officials to perform their duties under the Massachusetts Wetlands Protection Act and the City's wetlands protection ordinance.

Signed: _____ 8/22/16
(PROPERTY OWNER) (DATE)

G. LOCAL ORDINANCE FEE CALCULATION FORM – EXEMPT FROM FEES EXCEPT ADVERTISING FEE – MUNICIPAL PROJECT

ACTIVITY	LOCAL ORDINANCE FEE	# of Activities or Measurement	Subtotal
*Abbrev. Notice of Resource Area Delineation (ANRAD)			
Single Family House Project	$1/linear foot, first 100'; $0.50/lf, second 100'; $0.10/lf, each additional foot		
All Other Projects	***$1/linear foot, first 1000'; $0.50/lf, second 1000'; $0.10/lf, each additional foot		
%*Notices of Intent (NOI)			
Category 1 Activity	$100		
Category 2 Activity	$250		
Category 3 Activity	$525		
Category 4 Activity	$725		
Category 5 Activity	$2/foot		
Category 6 Activity - If no ANRAD was filed for the project site, then a local Cat. 6 fee must be paid in accordance with the ANRAD fee schedule	See ANRAD fee schedule		
Resource Area Alterations			
Buffer Zone, 75'-100' from resource area boundary	$0.05 / square foot		
Buffer Zone, 35'-75' from resource area boundary	$0.10 / square foot		
Buffer Zone, 0'-35' from resource area boundary	$0.25 / square foot		
Bordering Vegetated Wetland	$0.50 / square foot		
Bank	$5 / linear foot		
Land Under Water	$0.50 / square foot		
Land Subject to Flooding	$0.05 / square foot		
Riverfront Area	$0.05 / square foot		
Riverfront Area with the watershed of a potable water supply	$0.50 / square foot		
Land within 100' of a Certified Vernal Pool	$0.25 / square foot		
Local-only Jurisdictional Resource Area	$0.25 / square foot		
Land within 200' of a potable water supply	$0.50 / square foot		
		ADVERTISING FEE*	$45
		LOCAL ORDINANCE FEE TOTAL	$45
		For filings resulting from enforcement action, double the Local Ordinance Fee Total	

NOTES:

*Application is subject to an additional $45 Local Advertising Fee payable to the City of Haverhill prior to **EACH** advertising

***Local Ordinance Fee maximum of $100, if, when determined necessary by Commission, applicant agrees to ANRAD review by outside consultant under M.G.L. Ch. 44, sec. 53G

%Local Ordinance Fees for RDA, NOI, & RMOC increase 50% when project is also proposed within a Riverfront Area

Local Ordinance Fees passed by a 7 – 0 vote of the Commission on October 28, 2010, effective January 1, 2011

Enter your transmittal number → X269950 (Transmittal Number)

Your unique Transmittal Number can be accessed online: http://mass.gov/dep/service/online/trasmfrm.shtml

Massachusetts Department of Environmental Protection

Transmittal Form for Permit Application and Payment

1. Please type or print. A separate Transmittal Form must be completed for each permit application.

2. Make your check payable to the Commonwealth of Massachusetts and mail it with a copy of this form to: DEP, P.O. Box 4062, Boston, MA 02211.

3. Three copies of this form will be needed.

Copy 1 - the original must accompany your permit application. **Copy 2** must accompany your fee payment. **Copy 3** should be retained for your records

4. Both fee-paying and exempt applicants must mail a copy of this transmittal form to:

MassDEP
P.O. Box 4062
Boston, MA
02211

*** Note:**
For BWSC Permits, enter the LSP.

A. Permit Information

1. Permit Code: 7 or 8 character code from permit instructions	2. Name of Permit Category
WPA FORM 3	wetlands

3. Type of Project or Activity: dam rehabilitation

B. Applicant Information – Firm or Individual

1. Name of Firm - Or, if party needing this approval is an individual enter name below: City of Haverhill Water Department

2. **Last Name** of Individual	3. **First Name** of Individual	4. MI

5. Street Address: 131 Amesbury Road

6. City/Town	7. State	8. Zip Code	9. Telephone #	10. Ext. #
Haverhill	MA	01830	978-374-2385	

11. Contact Person	12. e-mail address (optional)
John D'Aoust	jdaoust@cityofhaverhill.com

C. Facility, Site or Individual Requiring Approval

1. Name of Facility, Site Or Individual: Crystal Lake Dam

2. Street Address: off Lake Street

3. City/Town	4. State	5. Zip Code	6. Telephone #	7. Ext. #
Haverhill	MA	01830		

8. DEP Facility Number (if Known)	9. Federal I.D. Number (if Known)	10. BWSC Tracking # (if Known)

D. Application Prepared by (if different from Section B)*

1. Name of Firm Or Individual: Weston & Sampson Engineers, Inc.

2. Address: 5 Centennial Drive

3. City/Town	4. State	5. Zip Code	6. Telephone #	7. Ext. #
Peabody	MA	01960	978-977-0110	2332

8. Contact Person	9. LSP Number (BWSC Permits only)
Mel Higgins	

E. Permit - Project Coordination

1. Is this project subject to MEPA review? ☒ yes ☐ no
   If yes, enter the project's EOEA file number - assigned when an Environmental Notification Form is submitted to the MEPA unit: ENF not yet submitted (EOEA File Number)

F. Amount Due

DEP Use Only

Permit No:

Rec'd Date:

Reviewer:

Special Provisions:

1. ☒ **Fee** Exempt (city, town or municipal housing authority)(state agency if fee is $100 or less).
   There are no fee exemptions for BWSC permits, regardless of applicant status.
2. ☐ Hardship Request - payment extensions according to 310 CMR 4.04(3)(c).
3. ☐ Alternative Schedule Project (according to 310 CMR 4.05 and 4.10).
4. ☐ Homeowner (according to 310 CMR 4.02).

Check Number	Dollar Amount	Date

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Haverhill
City/Town

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

Note: Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

off Lake Street — a. Street Address
Haverhill — b. City/Town
01830 — c. Zip Code

Latitude and Longitude:
42d 47' 51.09"N — d. Latitude
71d 8' 20.99"W — e. Longitude

571-1-17 — f. Assessors Map/Plat Number
g. Parcel /Lot Number

2. Applicant:

John — a. First Name
D'Aoust — b. Last Name
City of Haverhill Water Department — c. Organization
131 Amesbury Road — d. Street Address
Haverhill — e. City/Town
MA — f. State
01830 — g. Zip Code
978-374-2385 — h. Phone Number
i. Fax Number
jdaoust@cityofhaverhill.com — j. Email Address

3. Property owner (required if different from applicant): ☐ Check if more than one owner

a. First Name
b. Last Name
c. Organization
d. Street Address
e. City/Town
f. State
g. Zip Code
h. Phone Number
i. Fax Number
j. Email address

4. Representative (if any):

Mel — a. First Name
Higgins — b. Last Name
Weston & Sampson Engineers, Inc. — c. Company
5 Centennial Drive — d. Street Address
Peabody — e. City/Town
MA — f. State
01960 — g. Zip Code
978-977-0110 — h. Phone Number
i. Fax Number
higginsm@wseinc.com — j. Email address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

exempt — a. Total Fee Paid
exempt — b. State Fee Paid
exempt — c. City/Town Fee Paid

A. General Information (continued)

6. General Project Description:

Rehabilitation of existing dam. See Appendix A for additional information.

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

1. ☐ Single Family Home
2. ☐ Residential Subdivision
3. ☐ Commercial/Industrial
4. ☐ Dock/Pier
5. ☐ Utilities
6. ☐ Coastal engineering Structure
7. ☐ Agriculture (e.g., cranberries, forestry)
8. ☐ Transportation
9. ☒ Other

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. ☒ Yes ☐ No

If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

310 CMR 10.53 (3)i - dam maintenance
2. Limited Project Type

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

Essex	
a. County	b. Certificate # (if registered land)
none	none
c. Book	d. Page Number

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

1. ☐ Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
2. ☒ Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☒ Bank	47 (1. linear feet)	47 (2. linear feet)
b. ☐ Bordering Vegetated Wetland	(1. square feet)	(2. square feet)
c. ☒ Land Under Waterbodies and Waterways	1935 (1. square feet) 0 (3. cubic yards dredged)	1935 (2. square feet)

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ☒ Bordering Land Subject to Flooding	1,370 (1. square feet) 250 (3. cubic feet of flood storage lost)	1,370 (2. square feet) 260 (4. cubic feet replaced)
e. ☐ Isolated Land Subject to Flooding	(1. square feet) (2. cubic feet of flood storage lost)	(3. cubic feet replaced)
f. ☒ Riverfront Area	Greek Brook (1. Name of Waterway (if available) - **specify coastal or inland**)	

2. Width of Riverfront Area (check one):

☐ 25 ft. - Designated Densely Developed Areas only

☐ 100 ft. - New agricultural projects only

☒ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: 14,350 square feet

4. Proposed alteration of the Riverfront Area:

a. total square feet	b. square feet within 100 ft.	c. square feet between 100 ft. and 200 ft.
14,350	9,900	4,450

5. Has an alternatives analysis been done and is it attached to this NOI? ☒ Yes ☐ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☒ Yes ☐ No

3. ☐ Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Note: for coastal riverfront areas, please complete **Section B.2.f.** above.

B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. ☐ Land Under the Ocean	1. square feet 2. cubic yards dredged	
c. ☐ Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. ☐ Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. ☐ Coastal Dunes	1. square feet	2. cubic yards dune nourishment

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. ☐ Land Under Salt Ponds	1. square feet 2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above 1. cubic yards dredged	
l. ☐ Land Subject to Coastal Storm Flowage	1. square feet	

4. ☐ Restoration/Enhancement
If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.

a. square feet of BVW _____ b. square feet of Salt Marsh _____

5. ☐ Project Involves Stream Crossings

a. number of new stream crossings _____ b. number of replacement stream crossings _____

C. Other Applicable Standards and Requirements

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Notice of Intent – Required Actions (310 CMR 10.11).

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

   a. ☐ Yes ☒ No **If yes, include proof of mailing or hand delivery of NOI to:**

   Natural Heritage and Endangered Species Program
   Division of Fisheries and Wildlife
   1 Rabbit Hill Road
   Westborough, MA 01581

   2008
   b. Date of map

   If *yes*, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

   c. Submit Supplemental Information for Endangered Species Review*

      1. ☐ Percentage/acreage of property to be altered:

         (a) within wetland Resource Area _____ percentage/acreage

         (b) outside Resource Area _____ percentage/acreage

      2. ☐ Assessor's Map or right-of-way plan of site

2. ☐ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

   (a) ☐ Project description (including description of impacts outside of wetland resource area & buffer zone)

   (b) ☐ Photographs representative of the site

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/). Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.

C. Other Applicable Standards and Requirements (cont'd)

(c) ☐ MESA filing fee (fee information available at http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_fee_schedule.htm). Make check payable to "Commonwealth of Massachusetts - NHESP" and ***mail to NHESP*** at above address

*Projects altering **10 or more acres** of land, also submit:*

(d) ☐ Vegetation cover type map of site

(e) ☐ Project plans showing Priority & Estimated Habitat boundaries

(f) OR Check One of the Following

1. ☐ Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_exemptions.htm; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing. a. NHESP Tracking # b. Date submitted to NHESP

3. ☐ Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

a. ☒ Not applicable – project is in inland resource area only b. ☐ Yes ☐ No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

South Shore - Cohasset to Rhode Island border, and the Cape & Islands:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
1213 Purchase Street – 3rd Floor
New Bedford, MA 02740-6694
Email: DMF.EnvReview-South@state.ma.us

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: DMF.EnvReview-North@state.ma.us

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.

C. Other Applicable Standards and Requirements (cont'd)

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

   a. ☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.

   b. ACEC

5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

   a. ☒ Yes ☐ No

6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?

   a. ☐ Yes ☒ No

7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

   a. ☒ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:

      1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)

      2. ☒ A portion of the site constitutes redevelopment

      3. ☐ Proprietary BMPs are included in the Stormwater Management System.

   b. ☐ No. Check why the project is exempt:

      1. ☐ Single-family house

      2. ☐ Emergency road repair

      3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)

2. ☒ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.

D. Additional Information (cont'd)

3. ☒ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4. ☒ List the titles and dates for all plans and other materials submitted with this NOI.

Crystal Lake Dam Rehabilitation
a. Plan Title

Weston & Sampson
b. Prepared By

Frank Ricciardi, PE, LSP
c. Signed and Stamped by

8/1/16
d. Final Revision Date

1" = 10'
e. Scale

f. Additional Plan or Document Title

g. Date

5. ☐ If there is more than one property owner, please attach a list of these property owners not listed on this form.

6. ☐ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.

7. ☐ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.

8. ☒ Attach NOI Wetland Fee Transmittal Form

9. ☒ Attach Stormwater Report, if needed.

E. Fees

1. ☒ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

exempt
2. Municipal Check Number

3. Check date

exempt
4. State Check Number

5. Check date

exempt
6. Payor name on check: First Name

7. Payor name on check: Last Name

F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

1. Signature of Applicant

2. Date 8/22/16

3. Signature of Property Owner (if different)

4. Date

5. Signature of Representative (if any)

6. Date 8/22/16

For Conservation Commission:
Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:
One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:
If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

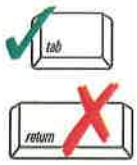
The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A. Applicant Information

1. Location of Project:

off Lake Street	Haverhill
a. Street Address	b. City/Town
exempt	
c. Check number	d. Fee amount

2. Applicant Mailing Address:

John		D'Aoust	
a. First Name		b. Last Name	
City of Haverhill Water Department			
c. Organization			
131 Amesbury Road			
d. Mailing Address			
Haverhill		MA	01830
e. City/Town		f. State	g. Zip Code
978-374-2385		jdaoust@cityofhaverhill.com	
h. Phone Number	i. Fax Number	j. Email Address	

3. Property Owner (if different):

a. First Name		b. Last Name	
c. Organization			
d. Mailing Address			
e. City/Town		f. State	g. Zip Code
h. Phone Number	i. Fax Number	j. Email Address	

B. Fees

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).

Fee should be calculated using the following process & worksheet. ***Please see Instructions before filling out worksheet.***

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract $12.50. To calculate the city/town share of the fee, divide the total fee in half and add $12.50.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
NOI Wetland Fee Transmittal Form
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
exempt			exempt

Step 5/Total Project Fee:

Step 6/Fee Payments:

Total Project Fee:	exempt a. Total Fee from Step 5
State share of filing Fee:	exempt b. 1/2 Total Fee **less** $12.50
City/Town share of filling Fee:	exempt c. 1/2 Total Fee **plus** $12.50

C. Submittal Requirements

a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection
Box 4062
Boston, MA 02211

b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

To MassDEP Regional Office (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

Project Description

Background

Crystal Lake Dam was reportedly originally constructed in 1930 and is located approximately 400 feet from Lake Street along a Tennessee Gas Pipeline Company utility easement. The dam is an approximately 250 foot long earth embankment and concrete and stone masonry dam with a primary spillway. The dam has a reported structural height of 8 feet. The dam is located at the east end of the lake. A concrete primary spillway discharges to an open channel and wetland area. There is no low-level outlet pipe through the dam.

The primary spillway is an 11.3 foot long concrete broad-crested weir with a breadth of 1.2 feet. The left training wall is a stone masonry wall. The right training wall is a stone masonry and concrete wall. The weir is fixed and uncontrolled. Downstream of the weir is a concrete splash pad that extends approximately 17 feet downstream.

The following deficiencies have been observed during previous inspections.:

- Seepage through the stone masonry and concrete structure has been observed and estimated in the at 0.5 to 1 gpm range.
- Combined foundation seepage flows have been estimated to be 2 to 3 gpm.
- The primary spillway was blocked with 6 inch diameter logs and debris.
- Continued deterioration of the auxiliary spillway crest was noted.
- A small sinkhole/erosion hole, approximately 16 inches deep was noted up-gradient of the standing water at the downstream toe of the dam.
- The splash-pad is broken near the toe of the downstream slope. The channel at this location plunges approximately 3 feet into an eroded stone lined channel off the broken edge of the splash-pad. It appears a portion of the concrete splash-pad has been displaced downstream.
- A rutted ATV trail was observed in the downstream area of the dam along the gas pipeline alignment.
- The dam has inadequate freeboard even at normal pool levels and cannot safely pass the SDF.
- General deterioration (cracking, spalling and crumbling) of the stone masonry and concrete structure to the right of the primary spillway has been observed.
- The dam is covered with trees and brush.

The dam rehabilitation project is being proposed to address the above-mentioned deficiencies.

Construction Sequence

Work will begin with defining the limit of work and installing erosion control measures as specified on the project drawings. To access the dam, a temporary access road will be created from Lake Street, running parallel, and north, of the existing gas easement.

Rehabilitation work includes but is not limited to the following items.

- Cut the brush and trees to ground surface on all portions of the dam and to at least 20 ft. downstream of the dam and remove them from the site. Inspect the embankment after clearing the vegetation for deficiencies that were not observed during this inspection due to vegetation cover.
- Armor the downstream channel banks to prevent erosion and scarp formation.
- Monitor and as required, repair the cracks and spalls on the concrete and mortared stone masonry covered embankment to the right of the spillway.
- Remove the root systems of all trees greater than four inches in diameter that were cut as part of routine maintenance. Fill voids with compacted granular fill.
- Raise/regrade the crest level of the embankments to provide a minimum of one foot of freeboard during the SDF. Form the embankment sideslopes/walls to uniform stable grades and install appropriate slope protection and drainage features.
- Repair/replace the spillway training walls as part of the embankment improvements.
- Repair/replace the cracked and broken discharge channel splash pad.
- Install a mineral toe drain along the base of the downstream concrete and mortared stone masonry wall right of the spillway to control seepage water. Armor the downstream area of the wall to prevent damage from overtopping.

Environmental Impacts

Rehabilitation efforts of Crystal Lake Dam will bring the dam into compliance with current Massachusetts dam safety regulations. The duration of the proposed rehabilitation work will likely be on the order of several months. The project has been designed to limit adverse impacts to the wetland resource areas as much as practicable.

Wetland resource areas affected by this project will be Land Under Water (LUW), 100-year flood zone, and Bank.

A total area of 1,935 square feet (sf) of land under water (LUW) will be impacted due to the placement of the reinforcing wall along the upstream bank of the dam. There will be no material removed/dredged from LUW. The vast majority of these impacts will be temporary in nature having to do with area to move around in during construction.

Impacts to the 100-year flood zone are related to bank stabilization and bank re-grading efforts along the downstream slope of the project. It is anticipated that there will be net of 10 cubic feet of flood storage gained in the flood zone.

An estimated 37 linear feet of bank associated with the unnamed intermittent stream to the east of the dam will be impacted due to the placement of the stream crossing construction. An additional 10 feet of bank will be impacted on the east side of the dam. In all, 47 linear feet of bank will be impacted.

For erosion and sediment control, all work areas adjacent to wetland resource areas will be lined with silt socks. The silt socks will be inspected daily and accumulated silt will be removed as appropriate.

ALTERNATIVES ANALYSIS

Deficiencies

Based on the observations and analyses in this report, the overall condition of Crystal Lake Dam is POOR. The primary deficiencies identified include:

- The earth embankment to the left of the primary spillway has irregular slope and crest geometry, and is overgrown with trees and brush.
- The upstream slope of the embankment to the left of the primary spillway is eroded and undercut at the normal water level. The concrete wall is settled and below normal water level.
- The concrete and stone masonry dam section to the right of the primary spillway has some trees and brush on the upstream and downstream of the walls and also some portions of the crest.
- The crest/upstream slope of the earthen embankment section between the right abutment and the concrete and stone masonry structure is eroded and is below the crest elevation of the concrete crest.
- General concrete deterioration (pot holes, cracking, spalling and crumbling) of the concrete cap of the concrete and stone masonry walls to the right of the primary spillway.
- The dam has inadequate freeboard at normal pool levels.
- Active seepage was observed from the toe of the downstream concrete and mortared stone masonry wall approximately 45 ft. to the right of the primary spillway.
- Debris in the form of large logs and tree branches were observed on the approach area, primary spillway weir, splash pad, and discharge channel.
- The concrete and stone masonry spillway training walls are deteriorated and the embankment behind the left training wall is eroded.
- The splash pad downstream of the spillway weir is cracked and displaced. The splash pad is broken near the break in the downstream slope. The channel at this location plunges approximately 3 ft. into an eroded stone lined channel off the broken edge of the splash pad. A portion of the concrete splash pad has been displaced downstream.
- Erosion and a scarp area were observed in the downstream channel. The left downstream channel bank is eroded and cut vertically.
- Standing water was observed approximately 65 ft. to the left of the right abutment in the downstream area.
- Overgrown trees, brush, and heavy forest debris and construction debris were observed in the downstream area.

Alternatives for Addressing Dam Safety Deficiencies

The following is a presentation of alternatives for addressing deficiencies at Crystal Lake Dam. The primary objective is to bring the structure into compliance with current Dam Safety Regulations.

No Action

Crystal Lake Dam is a SIGNIFICANT hazard structure. The safety deficiencies identified for this structure have developed over many years. If not corrected, there is a good probability that the condition of the dam will continue to deteriorate, requiring more costly remediation measures in the future, or possible damage to property downstream due to dam failure. The dam is currently not capable of safely passing the SDF. Compliance with current dam safety regulations and practice is necessary to ensure safe, continued service of the dam. This

solution does not achieve the goals of the Town of Grafton or the Office of Dam Safety. This alternative was therefore not considered further.

Dam Removal

Dam removal would revert the impoundment area to a natural stream channel. Dam removal would involve making a controlled breach of the dam of sufficient bottom width and bottom elevation so that water would no longer be impounded behind the structure. The side slopes of the breach would need to be formed at stable, maintainable slopes on the order of 3H:1V.

The channel floor and part of the side slopes should be armored with stone of sufficient size and angularity to prevent channel erosion during a selected design flood condition. Alternatively, bioengineered solutions to protect the channel may be preferred for aesthetic and wildlife habitat purposes. The majority of the impoundment area would likely become a vegetated wetland resource area. The impoundment bottom may need to be seeded for stabilization, but only if monitored natural re-vegetation is not successful in preventing surface erosion after the impoundment is drained.

Plantings along the top of the stream banks are recommended to add delineation and stabilization. These plantings should include species native to the area. Plantings in the gaps between riprap stones in the channel may also be appropriate for additional stream bank stability and aquatic ecosystem benefit.

However, significant environmental permitting will be required and public opposition to this alternative is likely depending on perceived changes in recreational opportunities or aesthetic value of the structure or impoundment.

Advantages:
The advantages to the Dam Removal alternative include eliminating the liability associated with dam ownership as well as eliminating the need for long-term maintenance and operational effort and cost.

There are several State and Federal agencies that advocate and provide funding for dam removal. The opportunities for funding would need to be evaluated during the design and permitting process.

Disadvantages:
Residents living along the pond shoreline and those who use the lake for recreation may be opposed to dam removal and loss of the impoundment. However, the area would likely revert to a diverse wetland and stream wildlife habitat area, which could be considered advantageous by the city and other stakeholders.

There could be impacts to groundwater supply wells in the area if the impoundment level is permanently reduced. This issue would have to be evaluated as part of the design.

The extent and cost of environmental permitting for dam removal is not clear and will depend on how the local conservation commission and the Town view a proposal for dam removal. A full environmental impact evaluation could be required to identify the extent of environmental impacts of Dam Removal.

Although feasible, in our opinion it is not likely that dam removal will be considered a favorable alternative to the City of Haverhill.

Dam Rehabilitation (preferred alternative)

The following rehabilitation measures are recommended to bring the dam into compliance with Chapter 253 Section 44-48 and 302 CMR 10.00 Dam Safety Regulations and current dam safety practice.

As noted in the Project Description (Appendix A), the improvements will include:

- Cut the brush and trees to ground surface on all portions of the dam and to at least 20 ft. downstream of the dam and remove them from the site. Inspect the embankment after clearing the vegetation for deficiencies that were not observed during this inspection due to vegetation cover.
- Armor the downstream channel banks to prevent erosion and scarp formation.
- Monitor and as required, repair the cracks and spalls on the concrete and mortared stone masonry covered embankment to the right of the spillway.
- Remove the root systems of all trees greater than four inches in diameter that were cut as part of routine maintenance. Fill voids with compacted granular fill.
- Raise/regrade the crest level of the embankments to provide a minimum of one foot of freeboard during the SDF. Form the embankment sideslopes/walls to uniform stable grades and install appropriate slope protection and drainage features.
- Repair/replace the spillway training walls as part of the embankment improvements.
- Repair/replace the cracked and broken discharge channel splash pad.
- Install a mineral toe drain along the base of the downstream concrete and mortared stone masonry wall right of the spillway to control seepage water. Armor the downstream area of the wall to prevent damage from overtopping.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

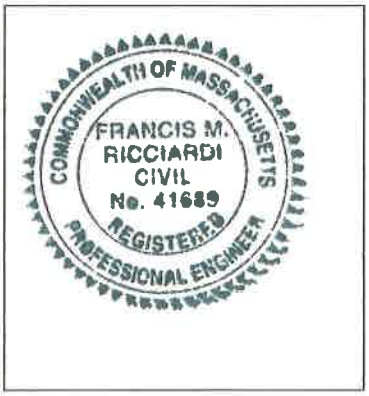
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



8/29/16

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☐ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☐ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☐ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☐ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☐ Soil Analysis provided.

☐ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☐ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☐ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☐ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☐ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☐ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☐ The BMP is sized (and calculations provided) based on:

- ☐ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☒ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☒ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☐ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☐ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☐ Name of the stormwater management system owners;
- ☐ Party responsible for operation and maintenance;
- ☐ Schedule for implementation of routine and non-routine maintenance tasks;
- ☐ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☐ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Stormwater Report

To Be Submitted with the Notice of Intent

Applicant/Project Name: City of Haverhill DPW / Crystal Lake Dam Rehabilitation

Project Address: Off Lake Street, Haverhill, MA

Application Prepared by:
Firm: Weston & Sampson, Inc.
Registered PE Frank Ricciardi, P.E., LSP

Below is an explanation concerning Standards 1-10 as they apply to the City of Haverhill DPW / Crystal Lake Dam Rehabilitation project:

General:
Past inspections have revealed that there are deficiencies with Crystal Lake Dam. This dam rehabilitation project is being proposed to address these deficiencies. Work will include, but is not limited to tree and brush removal on and around the dam, armoring downstream channel banks, raising the crest level of the embankments, and repair/replace spillway training walls.

Standard 1: No New Untreated Discharges

The proposed project will create no new untreated discharges. No new impervious area will be created during this project.

Standard 2: Peak Rate Attenuation

Since there will be no increase in impervious area, post-development (post-improvement) peak discharge rates will not exceed pre-development (pre-improvement) peak discharge rates.

To ensure that the work incorporates the performance standards recommended in the DEP's Stormwater Management Policy, necessary erosion and sedimentation control measures will be utilized during construction. These measures will include silt socks at the perimeter of the work area. Work at the dam will occur in the dry.

Standard 3: Recharge

As noted in the **Standard 2** explanation, the impervious area in the work area will not be increased at the completion of the project. Therefore, recharge rates will not change in the work area at the end of the project.

Standard 4: Water Quality

The proposed work will not change water quality at the site. There will be no increase in stormwater flow, and the design for dam improvements will not increase soil erosion. During the project, appropriate BMPs will be used to minimize sedimentation and soil erosion.

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

Not Applicable. There are no LUHPPLs in the work area.

Standard 6: Critical Areas

There will be no new discharge to critical areas.

Standard 7: Redevelopments and Other Projects Subject to the Standards Only to the Maximum Extent Practicable

This is a re-development and limited project which is subject to the standards only to the maximum extent practicable.

Standard 8: Construction Period Pollution Prevention and Erosion and Sediment Control

A detailed Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan is included. To ensure that the work incorporates the performance standards recommended in the DEP's Stormwater Management Policy, necessary erosion and sedimentation control measures will be utilized during construction. These measures will include silt socks at the perimeter of the work area. Work at the dam will occur in the dry.

Standard 9: Operation and Maintenance Plan

An operations and maintenance plan is not needed since there will not be any new stormwater management systems put in place in the project work area. The city will be responsible for maintaining all dam structures.

Standard 10: Prohibition of Illicit Discharges

By the nature of the proposed work, there will be no illicit discharges. There will be no opportunity for illicit discharges into the system.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

8/29/16

Signature and Date

Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan

SECTION 1: Introduction

Past inspections have revealed that there are deficiencies with Crystal Lake Dam. This dam rehabilitation project is being proposed to address these deficiencies. Work will include, but is not limited to tree and brush removal on and around the dam, armoring downstream channel banks, raising the crest level of the embankments, and repair/replace spillway training walls.

As part of this project, this "Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan" has been created to insure that no further disturbance to the wetland resource is created during the project.

SECTION 2: Construction Period Pollution Prevention Measures

Best Management Practices (BMPs) will be utilized as Construction Period Pollution Prevention Measures to reduce potential pollutants and prevent any off-site discharge. The objectives of the BMPs for construction activity are to minimize the disturbed areas, stabilize any disturbed areas, control the site perimeter and retain sediment. Both erosion and sedimentation controls and non-stormwater best management measures will be used to minimize site disturbance and ensure compliance with the performance standards of the WPA and Stormwater Standards. Area disturbed will be minimized by construction activities by reducing the area needed for vehicle access. This will reduce the potential for soil erosion and stormwater pollution problems. In addition, good housekeeping measures will be followed for the day-to-day operation of the construction site under the control of the contractor to minimize the impact of construction. This section describes the control practices that will be in place during construction activities. Recommended control practices will comply with the standards set in the MA DEP Stormwater Policy Handbook.

2.1 Minimize Disturbed Area and Protect Natural Features and Soil

In order to minimize disturbed areas, work will be completed within well-defined work limits. These work limits are shown on the construction plans. The Contractor shall not disturb native vegetation in the undisturbed wetland area without prior approval from the Engineer. The Contractor will be responsible to make sure that all of their workers and any subcontractors know the proper work limits and do not extend their work into the undisturbed areas. The protective measures are described in more detail in the following sections.

2.2 Control Stormwater Flowing onto and through the project

Construction areas adjacent to wetlands will be lined with silt socks. The silt socks will be inspected daily and accumulated silt will be removed as needed. Because work will occur in the dry, a silt curtain will not be required in the lake.

2.3 Stabilize Soils

The Contractor shall limit the area of land which is exposed and free from vegetation during construction. In areas where the period of exposure will be greater than two (2) months, mulching, the use of erosion control mats, or other protective measures shall be provided as specified.

The Contractor shall take account of the conditions of the soil where erosion control seeding will take place to insure that materials used for re-vegetation are adaptive to the sediment control.

2.4 Proper Storage and Cover of Any Stockpiles

The location of the Contractor's storage areas for equipment and/or materials shall be upon cleared portions of the job site or areas to be cleared as a part of this project, and shall require written approval of the Engineer.

Adequate measures for erosion and sediment control such as the placement of baled straw around the downstream perimeter of stockpiles shall be employed to protect any downstream areas from siltation.

There shall be no storage of equipment or materials in areas designated as wetlands.

The Engineer may designate a particular area or areas where the Contractor may store materials used in his operations.

2.5 Perimeter Controls and Sediment Barriers

Erosion control lines as described in Section 5 will be utilized to ensure that sedimentation does not occur outside the perimeter of the work area.

2.6 Storm Drain Inlet Protection

There are no storm drains in the work area.

2.7 Retain Sediment On-Site

The Contractor will be responsible to monitor erosion control measures. Whenever necessary the Contractor will clear sediment from the silt sock that have been silted up during construction. Daily monitoring should be conducted using the attached Monitoring Form.

The following good housekeeping practices will be followed on-site during the construction project:

2.8 Material Handling and Waste Management

Materials stored on-site will be stored in a neat, orderly manner in appropriate containers. Materials will be kept in their original containers with the original manufacturer's label. Substances will not be mixed with one another unless recommended by the manufacturer.

Waste materials will be collected and stored in a securely lidded metal container from a licensed management company. The waste and any construction debris from the site will be hauled off-site daily and disposed of properly. The contractor will be responsible for waste removal. Manufacturer's recommendations for proper use and disposal will be followed for materials. Sanitary waste will be collected from the portable units a minimum of once a week, by a licensed sanitary waste management contractor.

2.9 Designated Washout Areas

The Contractor shall use washout facilities at their own facilities, unless otherwise directed by the Engineer.

2.10 Proper Equipment/Vehicle Fueling and Maintenance Practices

On-site vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the risk of leakage. To ensure that leaks on stored equipment do not contaminate the site, oil-absorbing mats will be placed under oil-containing equipment during storage. Regular fueling and service of the equipment may be performed using approved methods and with care taken to minimize chance of spills. Repair of equipment or machinery within the 100' water resources area shall not be allowed without the prior approval of the Engineer. Any petroleum products will be stored in tightly sealed containers that are clearly labeled with spill control pads/socks placed under/around their perimeters.

2.11 Equipment/Vehicle Washing

The Contractor will be responsible to ensure that no equipment is washed on-site.

SECTION 3: Spill Prevention and Control Plan

The Contractor will be responsible for preventing spills in accordance with the project specifications and applicable federal, state and local regulations. The Contractor will identify a properly trained site employee, involved with the day-to-day site operations to be the spill prevention and cleanup coordinator. The name(s) of the responsible spill personnel will be posted on-site. Each employee will be instructed that all spills are to be reported to the spill prevention and cleanup coordinator.

3.1 Spill Control Equipment

Spill control/containment equipment will be kept in the Work Area. Materials and equipment necessary for spill cleanup will be kept either in the Work Area or in an otherwise accessible on-site location. Equipment and materials will include, but not be limited to, absorbent booms/mats, brooms, dust pans, mops, rags, gloves, goggles, sand, plastic and metal containers specifically for this purpose. It is the responsibility of the Contractor to ensure the inventory will be readily accessible and maintained.

3.2 Notification

Workers will be directed to inform the on-site supervisor of a spill event. The supervisor will assess the incident and initiate proper containment and response procedures immediately upon notification. Workers should avoid direct contact with spilled materials during the containment procedures. Primary notification of a spill should be made to the local Fire Department and Police Departments. Secondary Notification will be to the certified cleanup contractor if deemed necessary by Fire and/or Police personnel. The third level of notification (within 1 hour) is to the DEP or municipality's Licensed Site Professional (LSP). The specific cleanup contractor to be used will be identified by the Contractor prior to commencement of construction activities.

3.3 Spill Containment and Clean-Up Measures

Spills will be contained with granular sorbent material, sand, sorbent pads, booms or all of the above to prevent spreading. Certified cleanup contractors should complete spill cleanup. The material manufacturer's recommended methods for spill cleanup will be clearly posted and on-site personnel will be made aware of the procedures and the location of the information and cleanup supplies.

3.4 Hazardous Materials Spill Report

The Contractor will report and record any spill. The spill report will present a description of the release, including the quantity and type of material, date of the spill, circumstances leading to the release, location of spill, response actions and personnel, documentation of notifications and corrective measures implemented to prevent reoccurrence.

This document does not relieve the Contractor of the Federal reporting requirements of 40 CFR Part 110, 40 CFR Part 117, 40 CFR Part 302 and the State requirements specified under the Massachusetts Contingency Plan (M.C.P) relating to spills or other releases of oils or hazardous substances. Where a release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117 or 40 CFR Part 302, occurs during a twenty-four (24) hour period, the Contractor is required to comply with the response requirements of the above mentioned regulations. Spills of oil or hazardous material in excess of the reportable quantity will be reported to the National Response Center (NRC).

SECTION 4: Contact Information/Responsible Parties

Owner/Operator:
John D'Aoust
City of Haverhill Water Wepartment
131 Amesbury Road
Haverhill, MA 01830
978-374-2385

Engineer:
Frank Ricciardi, PE, LSP
Weston & Sampson Engineers, Inc.
5 Centennial Drive
Peabody, MA 01960
978-532-1900

Site Inspector:
TBD

Contractor:
TBD

SECTION 5: Erosion and Sedimentation Control

Erosion and Sedimentation Control Drawings can be found in the attached project plans. In addition a technical specification (***Section 01570 Wetlands Protection and Erosion Control***) has been included as part of Appendix E, which details all Erosion and Sedimentation controls.

SECTION 6: Site Development Plan

The Site Development Plan is included in the attached plans.

SECTION 7: Operation and Maintenance of Erosion Control

The erosion control measures will be installed as detailed in the technical specification ***01570 Environmental Protection***. If there is a failure to the controls the Contractor, under the supervision of the Engineer, will be required to stop work until the failure is repaired.

Periodically throughout the work, whenever the Engineer deems it necessary, the sediment that has been deposited against the controls will be removed to ensure that the

controls are working properly.

SECTION 8: Inspection Schedule

During construction, the erosion and sedimentation controls will be inspected daily. Once the Contractor is selected, an on site inspector will be selected to work closely with the Engineer to insure that erosion and sedimentation controls are in place and working properly. An Inspection Form is included.

Inspection Form

Inspected By: _____ Date: _____ Time: _____

YES	NO	DOES NOT APPLY	ITEM
			Do any erosion/siltation control measures require repair or clean out to maintain adequate function?
			Is there any evidence that sediment is leaving the site and entering the wetlands?
			Are any temporary soil stockpiles or construction materials located in non-approved areas?
			Are on-site construction traffic routes, parking, and storage of equipment and supplies located in areas not specifically designed for them?

Specific location, current weather conditions, and action to be taken:

_____

_____

_____

_____

_____

Other Comments:

_____

_____

Pending the actions noted above I certify that the site is in compliance with the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan.

Signature: _____ Date: _____

FIGURE 1
Crystal Lake Dam
Haverhill, Massachusetts

LOCUS MAP

10000
Scale In Feet

Weston&Sampson

Path: O:\Haverhill MA\Crystal Lake Dam Rehabilitation\GIS\maps\Figure 2 - locus.mxd User: higginsm Saved: 3/11/2016 2:19:11 PM Opened: 3/11/2016 2:19:23 PM

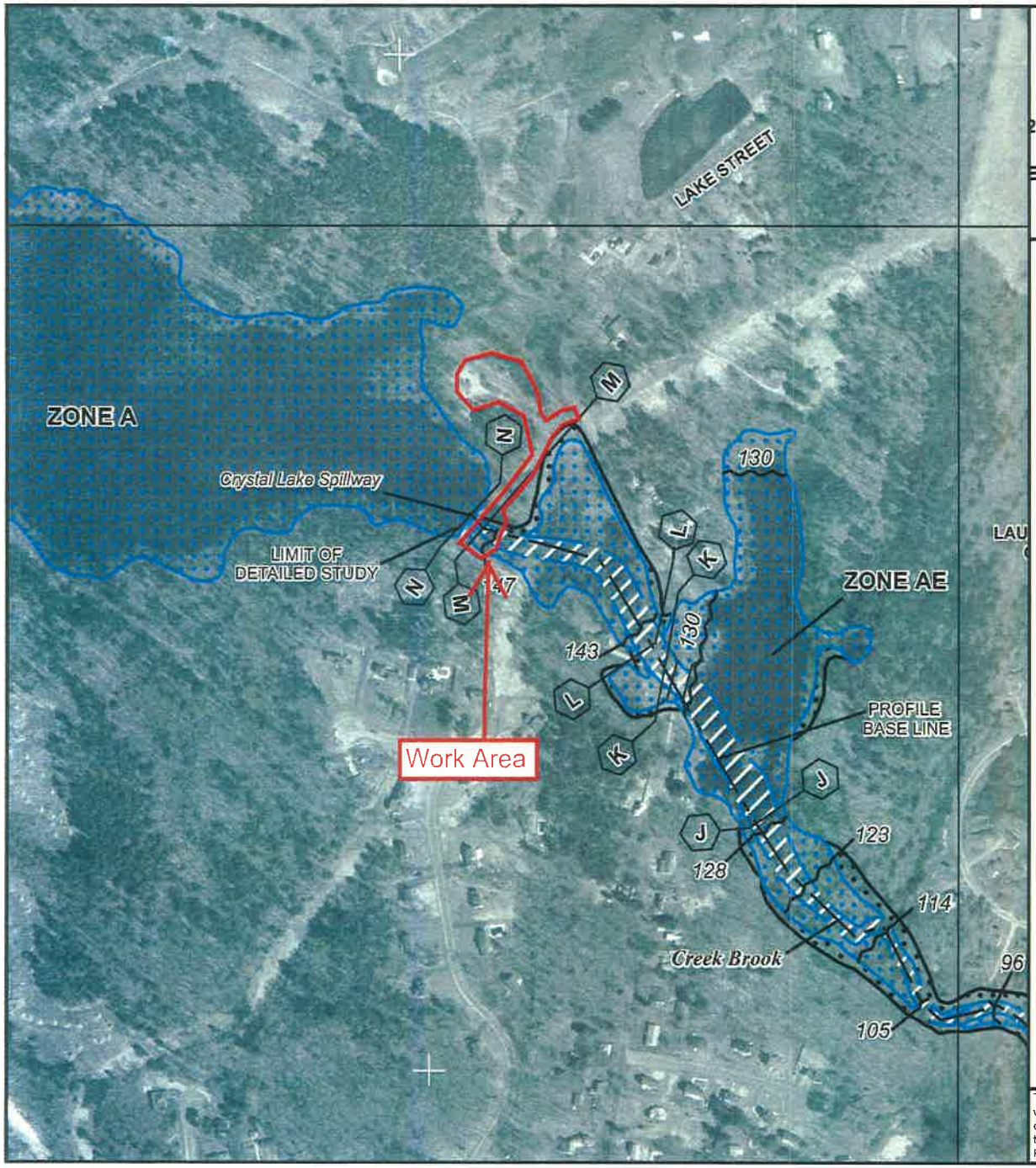
FIGURE 2
Crystal Lake Dam
Haverhill, Massachusetts

ENVIRONMENTAL RESOURCES MAP

100 0 100
Scale In Feet

Weston&Sampson

Path: O:\Haverhill MA\Crystal Lake Dam Rehabilitation\GIS\maps\Figure 1 - Env Receptor.mxd User: higginsm Saved: 3/17/2016 12:52:11 PM Opened: 3/17/2016 12:52:44 PM



MAP SCALE 1" = 500'

250 0 500 1000

FEET

METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0067F

FIRM

FLOOD INSURANCE RATE MAP

ESSEX COUNTY, MASSACHUSETTS (ALL JURISDICTIONS)

PANEL 67 OF 600

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HAVERHILL, CITY OF	250085	0067	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
25009C0067F

EFFECTIVE DATE
JULY 3, 2012

Federal Emergency Management Agency

SECTION 01570

ENVIRONMENTAL PROTECTION

PART 1 – GENERAL

1.01 DESCRIPTION:

A. The work covered by this section of the specifications consists of furnishing all labor, materials, tools and equipment and performing all work required for the prevention of environmental pollution during and as a result of construction operations under this contract.

B. The requirements set forth in this section of the specifications apply to the entire limit-of-work which is within the wetland resource areas protected under the Wetlands Protection Act.

C. All work under this Contract shall be in accordance with the Conservation Commissions' Orders of Conditions as well as any conditional requirements applied.

D. Prior to commencement of work, the Contractor shall meet with representatives of the Engineer to develop mutual understandings relative to compliance of the environmental protection program.

1.02 SUBMITTALS:

A. The Contractor shall submit for approval six sets of details and literature fully describing environmental protection methods to be employed in carrying out construction activities within the wetland resource areas protected under the Wetlands Protection Act.

PART 2 - PRODUCTS

2.01 Silt Sock

A. The silt sock shall have mesh fabric with openings of 1/8" – ¼" diameter. The sock material shall be either photo degradable within a one year period or nylon which has a life expectancy of 24 months. The sock shall be filled with a blend of composted leaf mulch, bark mulch, and wood chips that have been composted for a minimum of one year..

PART 3- EXECUTION

3.01 NOTIFICATION AND STOPPAGE OF WORK:

The Engineer will notify the Contractor in writing of any non-compliance with the provisions of the Order of Conditions. The Contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails to act promptly, the Engineer may order stoppage of all or part of the work until satisfactory corrective action has been taken. No claim for an extension of time or for excess costs or damage incurred by the Contractor as a result of time lost due to any stop work orders shall be made unless it was later determined that the Contractor was in compliance.

3.02 AREA OF CONSTRUCTION ACTIVITY:

A. Insofar as possible, the Contractor shall confine his construction activities to those areas defined by the plans and specifications. All land resources within the project boundaries and outside the limits of permanent work performed under this contract shall be preserved in their present condition or be restored to a condition after completion of construction at least equal to that which existed prior to work under this contract.

3.03 PROTECTION OF WATER RESOURCES:

A. The Contractor shall not pollute streams, lakes or reservoirs with fuels, oils, bitumens, calcium chloride, acids or other harmful materials. It is the Contractor's responsibility to comply with all applicable Federal, State, County and Municipal laws regarding pollution of rivers and streams.

B. Special measures should be taken to insure against spillage of any pollutants into public waters.

3.04 CONSTRUCTION IN AREAS DESIGNATED AS WETLANDS ON THE DRAWINGS:

A. Insofar as possible, the Contractor shall make every effort to minimize disturbance within areas designated as wetlands.

B. The Contractor shall perform his work in such a way that these areas are left in the condition existing prior to construction.

C. The elevations of areas designated as wetlands shall not be unduly disturbed by the Contractor's operations outside of the limit-of-work. If such disturbance does occur, the Contractor shall take all measures necessary to return these areas to the elevations which existed prior to construction.

D. Excavated materials shall not be permanently placed or temporarily stored in areas designated as wetlands. Temporary storage areas for excavated material shall be as directed by the Engineer.

E. During construction, easements within wetlands shall be lined with a continuous silt sock barrier.

3.05 PROTECTING AND MINIMIZING EXPOSED AREAS:

A. The Contractor shall limit the area of land which is exposed and free from vegetation during construction. In areas where the period of exposure will be greater than two (2) months, temporary vegetation, mulching or other protective measures shall be provided as specified.

B. The Contractor shall take account of the conditions of the soil where temporary cover crop will be used to insure that materials used for temporary vegetation are adaptive to the sediment control. Materials to be used for temporary vegetation shall be approved by the Engineer.

3.06 LOCATION OF STORAGE AREAS:

A. The location of the Contractor's storage areas for equipment and/or materials shall be upon cleared portions of the job site or areas to be cleared as a part of this project, and shall require written approval of the Engineer (see drawings). Plans showing storage facilities for equipment and materials shall be submitted for approval of the Engineer.

B. No excavated materials or materials used in backfill operations shall be deposited within a minimum distance of one hundred (100) feet of any watercourse or any drainage facility. Adequate measures for erosion and sediment control such as the placement of baled straw around the downstream perimeter of stockpiles shall be employed to protect any downstream areas from siltation.

C. There shall be no storage of equipment or materials in areas designated as wetlands.

D. The Engineer may designate a particular area or areas where the Contractor may store materials used in his operations.

E. Storage areas shall be restored to pre-construction conditions with the planting of native species of trees and shrubs.

3.07 PROTECTION OF LANDSCAPE:

A. The Contractor shall not deface, injure, or destroy trees or shrubs that are not designated for removal. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorages unless specifically authorized by the Engineer. Excavating machinery and cranes shall be of suitable type and be operated with care to prevent injury to trees which are not to be removed, particularly overhanging branches and limbs. The Contractor shall, in any event, be responsible for any damage resulting from such use.

B. Branches, limbs, and roots of trees not designated for removal shall not be cut except by permission of the Engineer. All cutting shall be smoothly and neatly done without splitting or crushing. When there is unavoidable injury to branches, limbs and trunks of trees, the injured portions shall be neatly trimmed and covered with an application of grafting wax or tree healing paint as directed.

C. Where, in the opinion of the Engineer, trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment or by his blasting or other operations, the Engineer may direct the Contractor to adequately protect such trees by placing boards, planks, poles or fencing around them. Any trees or landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition at the expense of the Contractor. The Engineer will decide what method of restoration shall be used, and whether damaged trees shall be treated and healed or removed and disposed of.

D. Cultivated hedges, shrubs, and plants which could be injured by the Contractor's operations shall be protected by suitable means or shall be dug up, balled and temporarily replanted and maintained. After construction operations have been substantially completed, they shall be replanted in their original positions and cared for until growth is re-established. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish their beauty or usefulness, they shall be replaced by items of a kind and quality at least equal to that existing at the start of the work.

3.08 CLEARING AND GRUBBING:

A. The Contractor shall clear and grub only on the Owner's land or the Owner's easements, and only the area required for construction operations, as approved by the Engineer.

3.09 DISCHARGE OF DEWATERING OPERATIONS:

A. Any water that is pumped and discharged from an excavation as part of the Contractor's water handling shall be filtered by an approved method prior to its discharge into a receiving water or drainage system.

B. Under no circumstances shall the Contractor discharge water to the areas designated as wetlands. When constructing in a wetlands area, the Contractor shall discharge water from dewatering operations directly to the nearest drainage system, stream, or waterway after filtering by an approved method.

C. The pumped water shall be filtered through filter fabric and baled straw, a vegetative filter strip or a vegetated channel to trap sediment occurring as a result of the construction operations. The vegetated channel shall be constructed such that the discharge flow rate shall not exceed a velocity of more than 1 foot per second. Accumulated sediment shall be cleared from the channel periodically.

3.10 DUST CONTROL:

A. During the progress of the work, the Contractor shall conduct his operations and maintain the area of his activities, including sweeping and sprinkling of streets as necessary, to minimize creation and dispersion of dust. Calcium Chloride shall not be used as a means to control dust.

3.11 SEPARATION AND REPLACEMENT OF TOPSOIL:

A. Topsoil shall be carefully removed from areas where excavations are to be made, and separately stored to be used again as directed. The topsoil shall be stored in an area acceptable to the Engineer and adequate measures shall be employed to prevent erosion of said material.

3.12 SILT SOCK:

A. To trap sediment and to prevent sediment from clogging drainage systems, a silt sock shall be used where shown on the drawings. Care shall be taken to keep the silt sock from breaking apart. The socks should be staked as noted on the plan details to prevent overturning, flotation, or displacement. All deposited sediment shall be removed periodically. Silt socks shall not be placed within a waterway.

3.13 SURFACE RESTORATION:

A. Grass shall be established on all areas where protective armoring treatments are not specified on the design drawings in accordance with Section 02920 – LOAMING AND SEEDING. A one-year guarantee of maintenance will be required to ensure the grass becomes established.

END OF SECTION

SECTION 01740

CLEANING UP

PART 1 - GENERAL

1.01 DESCRIPTION:

The Contractor must employ at all times during the progress of his work adequate cleanup measures and safety precautions to prevent injuries to persons or damage to property. The Contractor shall immediately, upon direction by the Engineer provide adequate material, equipment and labor to cleanup and make safe any and all areas deemed necessary by the Engineer.

PART 2 - PRODUCTS

Not applicable

PART 3 - EXECUTION

2.01 DAILY CLEANUP:

A. The Contractor shall clean up, at least daily, all refuse, rubbish, scrap and surplus material, debris and unneeded construction equipment resulting from the construction operations and sweep the area. The site of the work and the adjacent areas affected thereby shall at all times present a neat, orderly and workmanlike appearance.

B. Upon written notification by the Engineer, the Contractor shall within 24 hours clean up those areas, which in the Engineer's opinion are in violation of this section and the above referenced sections of the specifications.

C. If in the opinion of the Engineer, the referenced areas are not satisfactorily cleaned up, all other work on the project shall stop until the cleanup is satisfactory.

2.02 MATERIAL OR DEBRIS IN DRAINAGE FACILITIES:

A. Where material or debris has washed or flowed into or has been placed in existing watercourses, ditches, gutters, drains, pipes, structures, such material or debris shall be entirely removed and satisfactorily disposed of during progress of the work, and the ditches, channels, drains, pipes, structures, and work shall, upon completion of the work, be left in a clean and neat condition.

2.03 REMOVAL OF TEMPORARY BUILDINGS, STRUCTURES AND EQUIPMENT:

A. On or before completion of the work, the Contractor shall, unless otherwise specifically directed or permitted in writing, tear down and remove all temporary buildings and structures built by him; shall remove all temporary works, tools and machinery or other construction equipment furnished by him; shall remove all rubbish from any grounds which he has occupied; shall remove silt fences and hay bales used for trapping sediment; and shall leave the roads and all parts of the property and adjacent property affected by his operations in a neat and satisfactory condition.

2.04 RESTORATION OF DAMAGED PROPERTY:

A. The Contractor shall restore or replace, when and as directed, any property damaged by his work, equipment or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk and landscaping work. Materials, equipment, and methods for such restoration shall be as approved by the Engineer.

2.05 FINAL CLEANUP:

A. Before acceptance by the Owner, the Contractor shall perform a final cleanup to bring the construction site to its original or specified condition. This cleanup shall include removing all trash and debris off of the premises. Before acceptance, the Engineer shall approve the condition of the site.

END OF SECTION

O:\Haverhill MA\Crystal Lake Dam Rehabilitation\Permits\NOI\NOI\Appendix E Specs\01740 - Cleaning Up.doc

City of Haverhill Conservation Commission

HCC Form 3 – Notice of Intent Local Application Form

AFFIDAVIT OF SERVICE FOR ABUTTER NOTIFICATION

I, Mel Higgins, hereby certify under the pains and penalties of perjury that on
(NAME OF PERSON MAKING AFFIDAVIT)
August 31, 2016 I gave notification to all abutters pursuant to the requirements of the second
(DATE)
paragraph of Massachusetts General Laws Chapter 131, Section 40, the DEP Guide to Abutter Notification dated April 8, 1994, and Haverhill Municipal Ordinance Chapter 253, Section 5 in connection with the following matter:

A Notice of Intent filed under the Massachusetts Wetlands Protection Act and said ordinance by City of Haverhill Water DEpartment with the Haverhill Conservation Commission on
(NAME OF APPLICANT)
August 31, 2016 for property located off Lake Street (DATE)
(STREET ADDRESS AND ASSESSOR'S PARCEL ID)

The list of the abutters to whom the Abutter Notification Form sent, with their addresses and Assessor's parcel identification information that corresponds with the submitted map section, are attached to this application.

Signed: Mel Higgins August 31, 2016
(NAME OF PERSON MAKING AFFIDAVIT) (DATE)

City of Haverhill Conservation Commission

HCC Form 3 – Notice of Intent Local Application Form

ABUTTER NOTIFICATION FORM

In accordance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40 (the Wetlands Protection Act) and Haverhill Municipal Ordinance Chapter 253, Section 5, you are hereby notified of the following:

1. The name of the applicant is _City of Haverhill Water Department_____
2. Brief Project Description: ___Crystal Lake Dam rehabilitation_____
   _____
3. The applicant has filed a Notice of Intent ("NOI") with the Haverhill Conservation Commission seeking permission to remove, fill, dredge or alter an Area Subject to Protection Under the Wetlands Protection Act and/or Haverhill Municipal Ordinance Chapter 253 and/or to perform work within the buffer zone of such an Area.
4. The address of the lot where the activity is proposed is : off Lake Street Map 571 Parcel 1-17
   (INCLUDE ASSESSOR'S MAP/BLOCK/LOT)
5. Copies of the NOI may be examined at *the Haverhill Conservation Department Office* between the hours of *8am and 4pm* from *Monday through Friday*. Contact information is below. You may also find helpful application materials on the "Projects Under Review" section of the Commission's website.
6. Copies of the NOI may be obtained from either (check one) the applicant _____, or the applicant's representative X, by calling this telephone number (978) _977-_0110 x 2332 between the hours of _9:00_ and 5:00 on the following days of the week _Monday - Friday_____
7. Information regarding the *date, time, and place* of the public hearing may be obtained from the *Haverhill Conservation Department Office* between the hours of *8am and 4pm* from *Monday through Friday*. Contact information is below. You may also consult the "Agenda" section of the Commission's website.

NOTE: Notice of the public hearing, including its date, time and place, will be published at least five (5) days in advance in the *Haverhill Gazette newspaper*.

NOTE: Notice of the public hearing, including its date, time, and place, will be posted in Haverhill City Hall not less than forty-eight (48) hours in advance.

NOTE: You may contact the Haverhill Conservation Department for more information about this application, the Wetlands Protection Act, and Haverhill Municipal Ordinance Chapter 253. Please note the Department has only one staff person; every effort will be made to assist you in a timely manner.

Website: http://www.cityofhaverhill.org/departments/conservation_commission/index.php.
Email: conservation@cityofhaverhill.com
Phone: 978.374.2334

NOTE: For additional information about this application and the Act, you may contact the MA Department of Environmental Protection Northeast Regional Office Service Center.

Website: http://www.mass.gov/eea/agencies/massdep/about/contacts/northeast-region.html
Phone: 978.694.3200

Abutters List
with 300-feet of parcel 571-1-17

Parce.ID	Owner	Address
571-5-6	CITY OF HAVERHILL	4 SUMMER ST HAVERHILL, MA 01830
571-6-12	O`NEIL JOHN R ETUX	17 FIRE SIDE LANE HAVERHILL, MA 01832
571-6-11	LOPEZ JOHAN N	14 FULTON ST METHUEN, MA 01844
571-6-9A	QUINN WILLIAM F ETUX	5 FIRE SIDE LANE HAVERHILL, MA 01832
571-6-9	BELFIORE STEPHEN J	1 FIRE SIDE LN HAVERHILL, MA 01832
571-1-13-1	BRESNAHAN THOMAS	462 LAKE ST HAVERHILL, MA 01832
571-1-14	TAYLOR ROBERT E	466 LAKE ST HAVERHILL, MA 01832
571-2-25	BECKER JONATHAN D ETUX	473 LAKE ST HAVERHILL, MA 01832
571-1-15	CITY OF HAVERHILL	4 SUMMER ST HAVERHILL, MA 01830
571-1-16	STANSFIELD FRANCES L	490 LAKE STREET HAVERHILL, MA 01830
571-2-37	NOYES CHARLES E	569 LAKE ST HAVERHILL, MA 01832
571-2-27	RICHARDSON STEPHEN M	509 LAKE ST HAVERHILL, MA 01832
571-2-29	WILSON PAUL A ETUX	511 LAKE ST HAVERHILL, MA 01832
571-2-30	PRINCE DAVID W	14 FOUNTAIN ST BILLERICA, MA 01821
571-2-33	GALLANT JAY-ETUX	559 LAKE ST HAVERHILL, MA 01832
571-2-34	PEARSALL GREGG M ETUX	110 STEWART ST WEST NEWBURY, MA 01985
571-2-35	EATON CORY	609 LAKE ST HAVERHILL, MA 01832
575-2-5	WILSON JOSHUA-ETAL	596 LAKE ST HAVERHILL, MA 01832
575-2-8	CRYSTAL LAKE OPEN SPACE, INC	940 NORTH BROADWAY HAVERHILL, MA 01832
575-2-8A	CITY OF HAVERHILL	4 SUMMER ST HAVERHILL, MA 01830

FIGURE 1
Crystal Lake Dam
Haverhill, Massachusetts

FOR ABUTTERS LIST

Parcel_Polygons
Work Area

300 0 300
Scale In Feet

Weston & Sampson

Path: O:\Haverhill MA\Crystal Lake Dam Rehabilitation\GIS\maps\abutters.mxd User: higginsm Saved: 8/22/2016 12:50:40 PM Opened: 8/22/2016 12:56:27 PM

Five Centennial Drive
Peabody, MA 01960-7985
tel: 978-532-1900 fax: 978-977-0100
www.westonandsampson.com

planning, permitting, design, construction, operation, maintenance

Weston&Sampson

MEMORANDUM

TO: Mark Mitsch

FROM: Mel Higgins, PWS

DATE: March 29, 2016

SUBJECT: Wetlands Delineation
Haverhill, MA – Crystal Lake Dam

Background

On March 29, 2016, wetland resource areas were delineated around the Crystal Lake Dam, located at off of Lake Street in Haverhill, Massachusetts.

Wetland resources were identified and flagged in the field using pink flagging by a Weston & Sampson employee who is a nationally certified Professional Wetland Scientist (PWS) and trained in the wetland delineation process using the Massachusetts Department of Environmental Protection (MassDEP) manual "*Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act*". The location and flag numbering system can be seen on the attached field map. A further description of these wetland resource areas is presented, below.

Crystal Lake

(Wetland Flags TOB-c1 through TOB-c9 and TOB-e1 through TOB-e4)

The eastern edge of Crystal Lake was flagged at the edge of water/bank. Because the water was at the edge of the land, no bank per se was there. Because of the nearby spillway, water could not move more in a lateral direction unless under extreme flooding conditions because the water would simply flow over the dam spillway. As such, these wetland flags are the limit of land under water. Flags on both sides of the dam started where the cement dam ended. Flags TOB-c1 through TOB-c9 were placed on the northeastern limit of the lake, and flags TOB-e1 through TOB-e4 were placed on the south-western limit of the lake.

Unnamed Stream Flowing Parallel to Lake Street

(Wetland Flags B-1 through B-6 and B-1a through B-6a)

There is an unnamed stream flowing parallel to Lake Street, just west of the street. During the site visit, water was quickly flowing through the channel and over the boards that were placed over the channel as a foot bridge. This stream was not listed as either a perennial or intermittent stream according to USGA Streamstats Version 3.0 or in MassGIS data. Both the eastern bank (wetland flags B-1 through B-6) and western bank (wetland flags B-1a through B-6a) were flagged.

BVW East and South-East of Dam

(Wetland Flags BVW-a1 through BVW-a14)

This resource area is considered bordering vegetated wetlands to the unnamed stream mentioned above and Creek Brook which flows through the Crystal Lake Dam. Flagging started at the north-eastern extent of the resource area (near Lake Street) and continued in a south westerly direction until joining Greek Brook, at which point the flagging proceeded in a north-westerly direction, along Greek

Brook, towards the dam. Dominant vegetation at the site included sensitive fern (*Onoclea sensibilis*), silky dogwood (*Cornus amomum*) and pussy willow (*Salix discolor*), all species that thrive in wet conditions. Soil borings inside the wetland limit consisted of dark black muck. Hydrology indicators included shallow depth to saturated soils and water stained leaves.

Top of Bank – Greek Brook
(Wetland Flags TOB-b1 through TOB-b5 and TOB-d1 through TOB-d4)
The top of bank of on both sides of Greek Brook were flagged at the first change in angle of bank. The brook is considered a perennial stream according to USGS Streamstats Version 3.0 and MassGIS mapping. There is a break in the flagging of the western bank between flags TOB-d2 and TOB-d3 because of ponded water in this area being over the bank.

Temporarily Flooded area south of dam
(Wetland Flags LUW-1 through LUW-9)
An apparent beaver dam was located in Greek Brook, just south of the dam. All of these this blockage created ponded water behind the blockage, back near the toe of slope of dam. If the beaver dam were not there, the ponded area would likely not exist as water would only flow through Greek Brook. No wetland vegetation was noted in the water. Since this is not a permanent, ponded body of water, and wetland characteristics were not present, this area is not considered a wetland resource area. However, flags (LUW-1 through LUW-9) were left in the field to mark the edge of water.

Attached please find a field map showing the different wetland limits flagged in the field with associated wetland flag numbers. Completed DEP Bordering Vegetated Wetland Delineation Field Data forms area also attached to this memorandum.

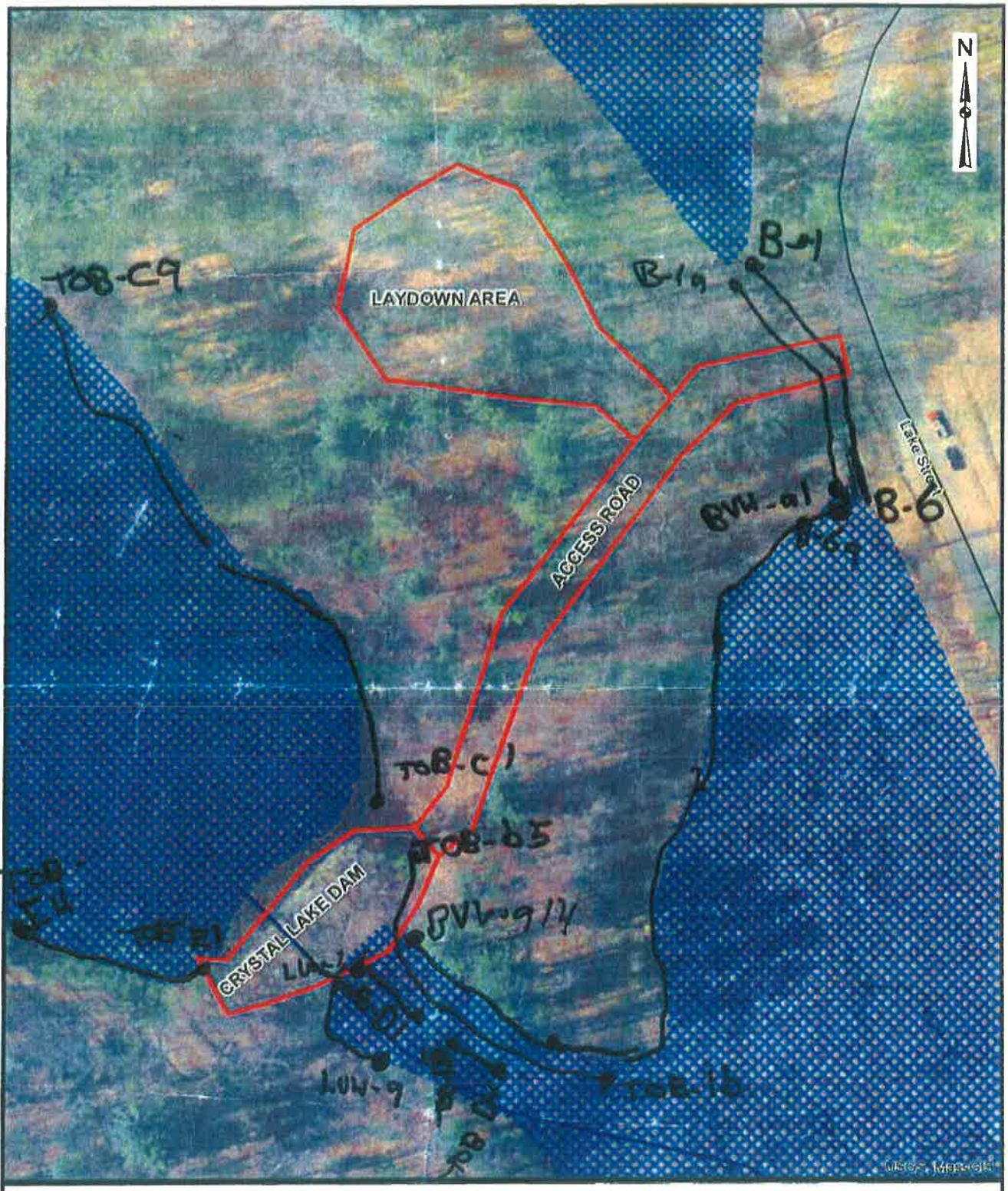


FIGURE 1
Crystal Lake Dam
Haverhill, Massachusetts

WETLANDS FIELD MAP

Work Area
DEP Wetlands
Perennial Stream
Intermittent Stream

100 0 100
Scale in Feet

Weston & Sampson

Plotted: C:\Haverhill MA\Crystal Lake Dam Rehabilitation\GIS\maps\wetlands field map.mxd User: higginsm Saved: 3/21/2019 8:52:04 AM Opened: 3/21/2019 8:52:15 AM

MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Weston & Sampson Prepared by: Weston & Sampson Project location: Haverhill Crystal Lake DEP File #:

Check all that apply:

- ☐ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- ☒ Vegetation and other indicators of hydrology usedto delineateBVW boundary: fill out Sections I and II
- ☐ Method other than dominance test used (attach additional information)

Section I.

Vegetation	Observation Plot Number: 1		Transect Number: BVW-92	Date of Delineation: 3/29/16
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Tree layer - none				
Shrub layer				
Silky dogwood (Cornus amomum)	15%	50%	Yes	FACW*
Possy willow (Salix discolor)	15%	50%	Yes	FACW*
Cover layer:				
Sensitive fern (Onoclea sensibilis)	60%	100%	Yes	FACW*

* *Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.*

Vegetation conclusion:

Number of dominant wetland indicator plants: 3 Number of dominant non-wetland indicator plants: 0

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? (yes) no

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? (yes) no
title/date: Essex Co. (MA605)
map number: online
soil type mapped: muck
hydric soil inclusions:

Are field observations consistent with soil survey? (yes) no
Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
	0-10	muck	

Remarks:

3. Other:

Conclusion: Is soil hydric? (yes) no

Other Indicators of Hydrology: (check all that apply & describe)

- ☐ Site Inundated: _____
- ☐ Depth to free water in observation hole: _____
- ☒ Depth to soil saturation in observation hole: 2" bgs
- ☐ Water marks: _____
- ☐ Drift lines: _____
- ☐ Sediment Deposits: _____
- ☐ Drainage patterns in BVW: _____
- ☐ Oxidized rhizospheres: _____
- ☒ Water-stained leaves: _____
- ☐ Recorded Data (streams, lake, or tidal gauge; aerial photo; other): _____
- ☐ Other: _____

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ # of non-wetland indicator plants	✓	
Wetland hydrology present:		
Hydric soil present	✓	
Other indicators of hydrology present	✓	
Sample location is in a BVW	✓	

Submit this form with the Request for Determination of Applicability or Notice of Intent.

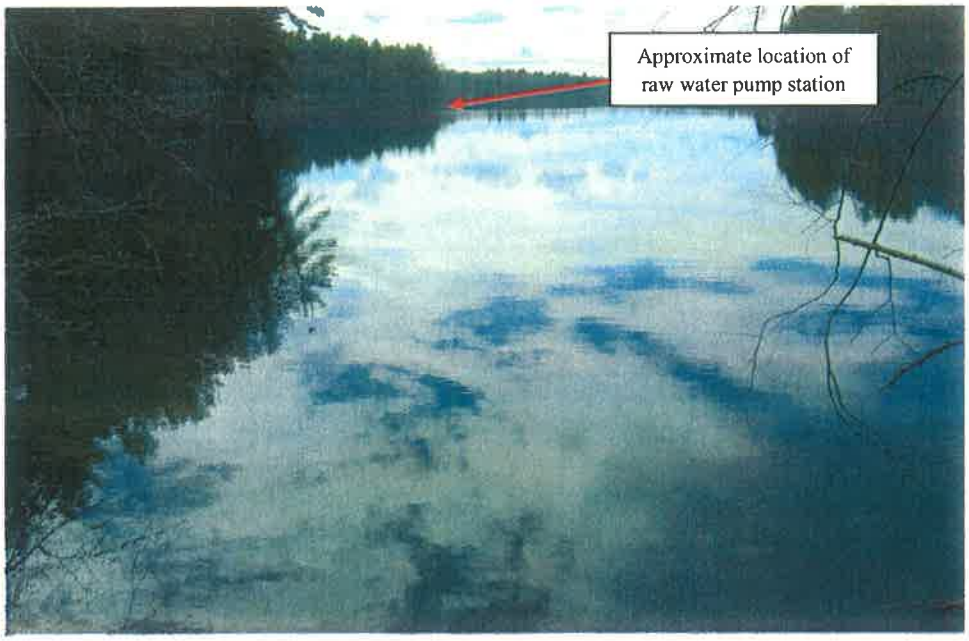


Photo 1 – Crystal Lake from the crest of the dam. The raw water pump station intake is reportedly located along the southern shoreline approximately 2,500 ft. upstream of the dam.

Photo 2 - The crest of the dam from the right abutment. A stone masonry wall with a concrete topping that forms the crest of the dam is the primary impounding feature. Small trees and shrubs can be seen growing along the upstream and downstream sides of the crest.

Photo 3 - The crest of the concrete and stone masonry wall to the right of the primary spillway looking towards the right abutment area. The crest of the left side of the spillway (where this photo was taken) is at a noticeably lower elevation than the right side.

Photo 4 - The crest of the concrete and stone masonry wall to the left of the primary spillway looking towards the right abutment area. It appears that the concrete and stone masonry wall may have continued left of the spillway, and if so, has undergone noticeable settlement to the extent that it no longer functions as intended.

Photo 5 - The left abutment area and access path to the dam crest. Notice the apparent settlement of the (former) concrete and stone masonry crest.

Photo 6 - The right abutment area from the dam crest and termination of the concrete and stone masonry wall. A 20 ft. long earthen portion extends to the right from the end of the wall before the embankment crest meets naturally higher ground.

Photo 7 - The crest of the concrete and stone masonry wall to the right of the spillway looking towards the right abutment area. The concrete crest cap is cracked and spalled in some areas and the structure has minimal freeboard under normal loading conditions. Brush and small trees can be seen growing along the crest. This area appears to be frequented by children as evident by the former fire pit.

Photo 8 - Seepage is present through an area along the base of the stone masonry wall to the right of the primary spillway that appears to have been damaged or undermined.

Photo 9 - An isolated wet area approximately 50 ft. downstream of the right end of the stone masonry wall. Debris, shrubs, and trees were also observed in this general area.

Photo 10 - The primary spillway from downstream. Logs and other fallen debris have been either washed or placed in the discharge channel. Note the makeshift bridge crossing the spillway, likely place by children to access the concrete dam crest to the left of this photo.

Photo 11 - The primary spillway and weir from the right discharge channel wall. The top of the left training wall is lower than the right and is deteriorated. The makeshift bridge crossing the spillway is causing a buildup of brush, log, and other natural debris at the weir and obstructing flow. The concrete splash pad immediately downstream of the weir is cracked and appears to be displaced.

Photo 12 - Looking towards the left abutment area from the concrete and stone masonry wall to the right of the primary spillway. Multiple fallen trees and logs are obstructing natural flow over the spillway weir. It is clear in this photo that the crest elevation on the left side of the spillway is noticeably lower (possibly due to settlement) than the right.

Photo 13 - The primary spillway discharge channel. Debris is present in the channel and the banks appear to be eroded in some locations. Trees and brush were observed in the general downstream area. The clearing to the left of this photo is a gas pipeline right-of-way.